State of Tennessee Regional Water Supply Planning Pilot Studies

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Project Overview

- Two Pilot Areas - Drought of 2007
  - North Central Tennessee
  - South Cumberland Plateau
- Source Water Development Focused
- Stakeholders and Communities Involved
  - 5 Pilot Area Specific Meetings to Date
- Robust Planning Team
  - State, Federal, NGO, Academia

Regional Planning Partners

USGS science for a changing world

US Army Corps of Engineers. Nashville District

TACIR

The Nature Conservancy Protecting nature. Preserving life.™

Tennessee Advisory Commission on Intergovernmental Relations

DEPARTMENT OF ENVIRONMENT & CONSERVATION

Tennessee Association of Utility Districts

TENNESSEE WILDLIFE RESOURCES AGENCY

Tennessee Tech UNIVERSITY

THE UNIVERSITY OF MEMPHIS.

TVA

TENNESSEE DEPARTMENT OF ECONOMIC & COMMUNITY DEVELOPMENT

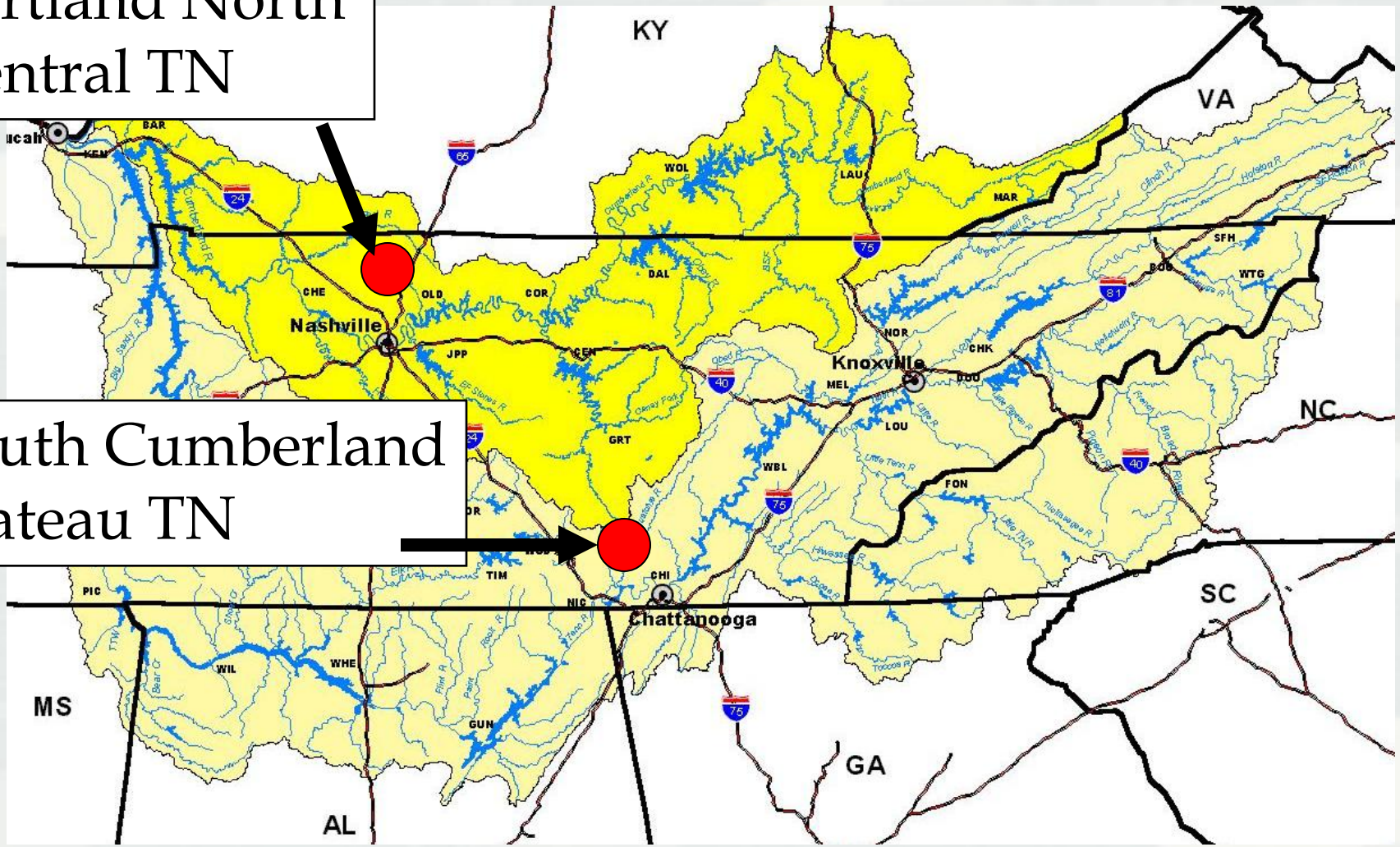
LAND TRUST FOR TENNESSEE

Tennessee Department of Agriculture

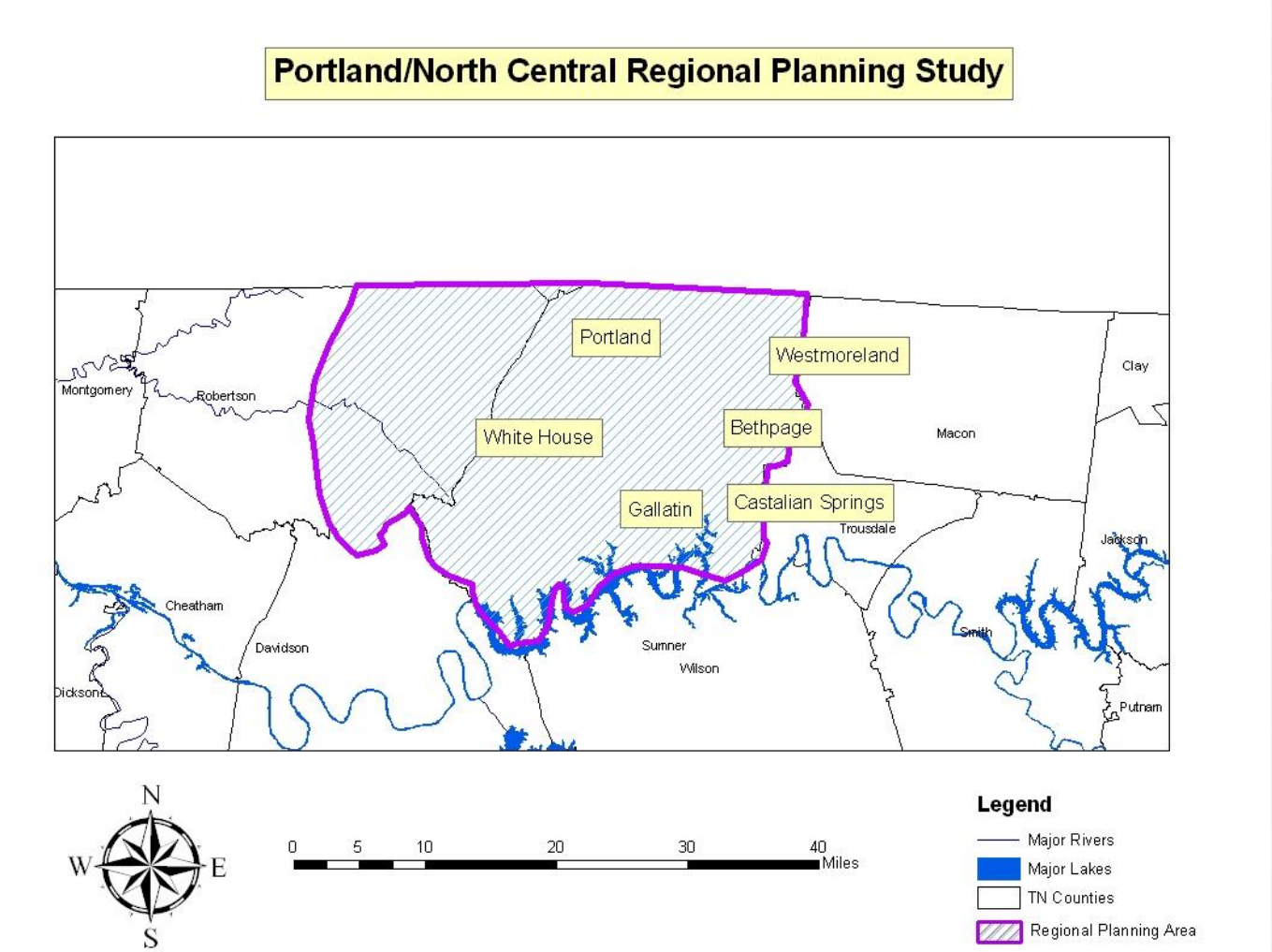
Pilot Areas

Portland North Central TN

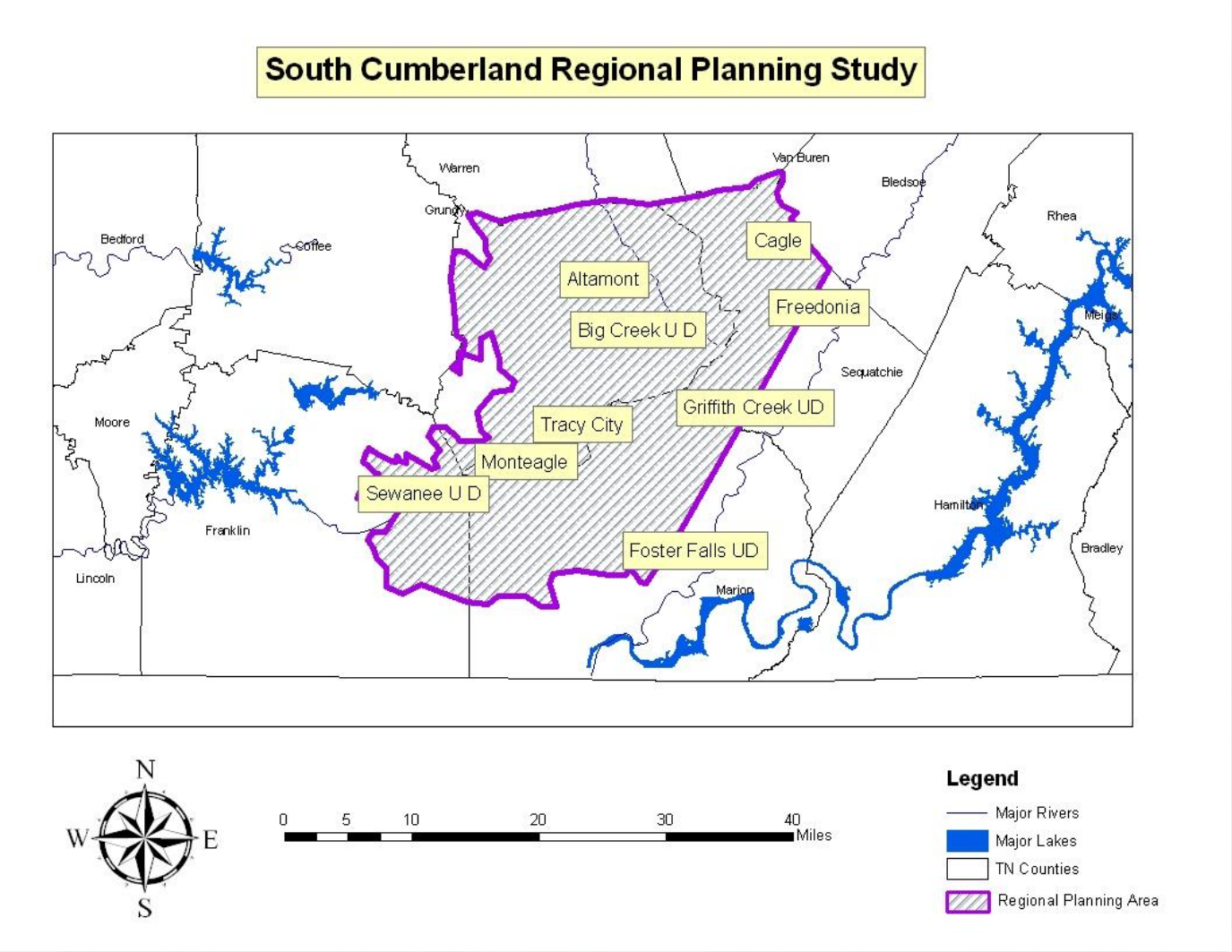
South Cumberland Plateau TN



Pilot Areas


Portland/North Central Regional Planning Study
Portland
Westmoreland
White House
Bethpage
Gallatin
Castalian Springs
Montgomery
Robertson
Clay
Macon
Trousdale
Jackson
Cheatham
Davidson
Sumner
Wilson
Smith
Putnam
Dickson
N
W
E
S
0 5 10 20 30 40 Miles
Legend
Major Rivers
Major Lakes
TN Counties
Regional Planning Area

Pilot Areas


South Cumberland Regional Planning Study
Warren
Van Buren
Bledsoe
Rhea
Grundy
Bedford
Coffee
Cagle
Altamont
Freedonia
Big Creek U D
Meigs
Sequatchie
Griffith Creek UD
Tracy City
Moore
Monteagle
Sewanee U D
Hamilton
Franklin
Foster Falls UD
Bradley
Lincoln
Marion
N
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0 5 10 20 30 40
Miles
Legend
Major Rivers
Major Lakes
TN Counties
Regional Planning Area

Regional Water Supply Planning

- Sustainably match water sources with current & future needs
- Regional approach and multi-utility focus
- Collaborative effort
- Model for statewide regional resource planning


White House


Portland


Big Creek


Monteagle

Project Review

- Study Area Description
- Existing Water Source Yields
- Water Demand Projections
- Study Area Needs – Need Statements
- Alternatives and Evaluations
- Alternative Screening Protocol
  - ▶ Tier 1 Results
  - ▶ Tier 2 Protocol

Pilot Area Need Statements

- North Central
  - Principle water source is Old Hickory Lake
    - Provides 90% of study area existing demand
  - Portland
    - Existing small sources not sufficient
    - Purchases finished water as needed
    - No formal contracts: security is not provided
  - Pilot area demand projected to increase from 21 MGD to 30 MGD by 2030
    - Sufficient raw water in Cumberland system

Pilot Area Need Statements

- South Cumberland Plateau
  - ► Raw water supply strained in 2007
    - Monteagle managed drought by purchasing from adjacent utilities and establishing temporary sources
  - ► Utility interconnections well established
    - Paramount to region's ability to manage drought
  - ► Pilot area demand projected to increase from 2.1 MGD to 2.2 MGD by 2030
    - Composite yield of existing sources barely sufficient
    - Indicate need for source development

Water Source Alternatives

- North Central
  - Interconnection – White House to Portland
  - Caney Fork Creek Dam – New Reservoir
  - Groundwater – Wells
  - Pipeline – Cumberland River
- South Cumberland
  - Interconnections - Regional
  - Big Creek Dam – New Reservoir
  - Ramsey Lake – Purchase Existing Lake
  - Big Fiery Gizzard – Raise Existing Dam
  - Pipeline – Tennessee River

Alternative Screening Protocol

- Tier 1:
  - Reliable Capacity
    - Need met with minimal risk
  - Project Cost
    - Feasibility, Design, Construction, Operation and Maintenance
  - Implementability
    - Permitting, Public Acceptance, Property Acquisitions, Constructability
  - Flexibility
    - Phased Implementation, Drought Resistance
- Principle factor in Tier 1 evaluations is Reliable Capacity

Alternative Screening Protocol

- Tier 2:
  - Storage Remaining (South Cumberland)
    - Drought Resistance
  - Cost
  - Water Quality
    - Raw and Finished
  - Environmental
    - Benefits and Impacts
  - Other Factors
- Principle factor in Tier 2 evaluations is Cost

Tier 2 Screening Results

- North Central

Alternative	Cost (in millions)	Finished Water Quality	Environmental Benefits or Impacts	Other Factors
Interconnection – WHUD to Portland	$4.5*	Potential Improvement	Slight impacts from infrastructure construction	Requires Cooperation Between Entities
Caney Fork Creek Reservoir	$13.2	No Change	Substantial alteration of aquatic resources	Conflicts with Clean Water Act Compliance
Portland Raw Water Pipeline to Cumberland River	$13.0	No Change	Slight impacts from pipeline construction	Treatment plant operations

* Does not include rate that would be charged by WHUD, which must be negotiated

Tier 2 Screening Results

- South Cumberland Plateau

Alternative	Storage Remaining [1] (million gallons)	Cost (millions)	Water Quality	Environmental Benefits or Impacts	Other Factors
Raise Big Fiery Gizzard Dam w/Modified Release Schedule	5.4	$3.9	No Change	Release study required	Study could increase existing release requirements
Ramsey Lake	70.4	$10 to $15 [3]	Additional treatment may be needed	Release study required	Dam safety classification will change
Phase I South Pittsburg Finished Water Pipeline	N/A [2]	$22	Long transmission could cause problems	None known	High energy use/costs could increase cost to consumers more than other alternatives

(1) Above 20% Reserve Storage

(2) Relies on Tennessee River; highly drought resistant

(3) Includes a range of potential routing options, real estate costs, and costs to improve spillway

Recommended Alternatives

- North Central – Interconnection from WHUD to Portland
  - Cheapest and most economically feasible alternative
  - Potential for phased implementation
  - Can be expanded to meet needs beyond 2030

Recommended Alternatives

- South Cumberland – Raising Big Fiery Gizzard Dam and Reservoir with Modification of Downstream Releases
  - ► Provides adequate supply for region through 2030
  - ► Least expensive alternative by significant margin
  - ► Can be accomplished relatively quickly
  - ► Additional studies required to determine downstream flow requirements
    - Balance ecological needs with water supply requirements

Next Steps for Implementation

- North Central
  - Regional Conservation and Demand Management Efforts
  - Drought Management
    - Formal coordination plans between utilities in the region
    - OASIS Statewide License
  - Community Engagement
  - Engineering Studies
    - Water purchase frequency
    - Implementation phasing
    - Refined Cost Estimates

Next Steps for Implementation

- North Central
  - Rate Studies
  - Water Purchase Contract
    - Model after Simpson Co., KY?
  - Project Financing Options
    - USDA
    - USACE
    - DWSRF Watershed Enhancement
    - Pay-as-you-go

Next Steps for Implementation

- South Cumberland Plateau
  - Regional Conservation and Demand Management Efforts
  - Drought Management
    - Formal coordination plans between utilities in the region
    - OASIS Statewide License
  - Community Engagement
  - Commitment to Regional Approach
    - Inter-local Cooperation – T.C.A., Title 12, Chapter 9
  - Engineering Studies
    - Modified Release Schedule
    - Interconnections - Distribution
    - Refine Cost Estimates

Next Steps for Implementation

- South Cumberland Plateau
  - Permitting
  - Rate Studies
  - Project Financing Options
    - Pay-as-you-go Joint Financing
    - USDA Rural Development
    - USACE
    - ECD CDBG

Questions??